

REMARKS/ARGUMENTS

Claims 1-9, 15, 17-19 and 22-24 are pending. By this Amendment, claims 1, 8 and 15 are amended. Support for the amendments to claims 1, 8 and 15 can be found, for example, in the present specification at page 5, lines 11 to 18, and in original claims 1, 8 and 15. No new matter is added. In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

Allowable Subject Matter

Applicants thank the Examiner for the indication in the Office Action that claim 15 is allowed and that claim 17 contains allowable subject matter.

Rejection Under 35 U.S.C. §103

The Office Action rejects claims 1-9, 18, 19 and 22-24 under 35 U.S.C. §103(a) over U.S. Patent No. 5,270,434 to Tetart et al. ("Tetart") in view of U.S. Patent No. 6,395,819 to Espiard et al. ("Espiard") and WO 01/23655 to Zeng et al. ("Zeng"). Applicants respectfully traverse the rejection.

Claim 1 recites "[a] product, comprising mineral fibers that have been coated with a sizing composition, wherein: the sizing composition comprises a liquid resin and a crosslinking agent; the liquid resin exhibits a dilutability in water at 20°C at least equal to 1,000%; the liquid resin comprises at least 70% by weight of condensates obtained by reacting a phenolic compound simultaneously with formaldehyde and an aminoalcohol according to the Mannich reaction; the mineral fibers comprise glass or rock ..." (emphasis added). Tetart, Espiard and Zeng fail to disclose or suggest such a product.

The Office Action correctly points out that Tetart discloses a sizing composition including a resin obtained by reacting a phenol, formaldehyde and an amine. *See, e.g.,* Tetart,

column 3, lines 44 to 53. Moreover, Tetart discloses that the amine may be an aminoalcohol. See Tetart, column 3, line 65 to column 4, line 4. However, the resin of Tetart is obtained in manner that differs from the manner that the resin in claim 1 is obtained. In particular, the resin of Tetart is obtained by reacting a phenol with formaldehyde and then subsequently adding an amine. See Tetart, column 4, lines 20 to 28. That is, in Tetart, as discussed below, a phenol is not simultaneously reacted with formaldehyde and an aminoalcohol, as recited in claim 1.

While product-by-process limitations are not generally given weight in determining the patentability of product claims, the structure and compositions implied by such process limitations are to be considered when assessing patentability. See MPEP §2114. The resin of Tetart is obtained by: (1) reacting a phenol and a formaldehyde in a molar ratio of greater than 1 in the presence of an alkali catalyst; (2) cooling the reaction mixture; and (3) reacting the excess formaldehyde in the reaction mixture with urea. See Tetart, column 4, lines 20 to 62. The process of Tetart distinctively involves introducing an amine suitable for the Mannich reaction during the cooling step (2). See Tetart, column 4, lines 41 to 49.

In step (1) of the Tetart process, the phenol and the formaldehyde are reacted until a phenol conversion rate of at least 93% is obtained and then step (2) is commenced. See Tetart, column 4, lines 29 to 33. At the conclusion of step (1), the reaction mixture is composed of phenol-formaldehyde condensates, excess phenol, and excess formaldehyde.

In step (2) of the Tetart process, the amine is added as cooling begins or after the reaction mixture has been cooled to between 20 and 45 °C. See Tetart, column 4, lines 46 to 49. The amine reacts with the excess phenol and formaldehyde according to the Mannich reaction to provide phenol-formaldehyde-amine condensates. Accordingly, at the conclusion of step (2), the reaction mixture includes phenol-formaldehyde condensates (in a large

quantity), phenol-formaldehyde-amine condensates (in a small quantity), excess phenol, and excess formaldehyde.

In step (3) of the Tetart process, urea is added to the reaction mixture to form urea-formol condensates, thus even further reducing the amount of excess formaldehyde. *See Tetart*, column 4, lines 50 to 55. The liquid resin obtained at the conclusion of step (3), again, includes phenol-formaldehyde condensates (in a large quantity), phenol-formaldehyde-amine condensates (in a small quantity), excess phenol, and excess formaldehyde.

In contrast to the resin obtained in Tetart, the resin of claim 1 is obtained by reacting a phenolic compound simultaneously with formaldehyde and an aminoalcohol. This reaction yields at least 70% by weight of phenol-formaldehyde-amine condensates. By contrast, as discussed above, the resin of Tetart includes a large quantity of phenol-formaldehyde condensates and a small quantity of phenol-formaldehyde-amine condensates. That is, the resin of Tetart differs in composition from the resin in claim 1. Accordingly, the sizing composition of claim 1 is distinct from the sizing composition of Tetart.

As discussed above, a resin obtained by reacting a phenolic compound simultaneously with formaldehyde and an aminoalcohol, as in claim 1, has different properties from conventionally obtained resins, as in Tetart. In the present specification, resins obtained as recited in claim 1 (by reacting a phenolic compound simultaneously with formaldehyde and an aminoalcohol) are compared with a resin that is not obtained in such a manner. *See generally* present specification, pages 9 to 12. The inventive resins are significantly improved with respect to the conventional resin in the amounts of free phenols and free formaldehydes. *See* present specification, page 9, lines 17 to 19, page 10, lines 15 to 17, page 11, lines 8 to 10. The differing properties between the inventive resins and the conventional resin make clear that the inventive resins and the conventional resin are not the same. One of

ordinary skill in the art would understand that the synthetic route described in Tetart does not provide the resin as recited in claim 1.

As discussed in the present specification, the present inventors discovered that by adding formaldehyde and an aminoalcohol to a phenolic compound simultaneously, it is possible to obtain a resin with particularly low residual contents of formaldehyde and phenol. *See* present specification, page 5, line 30 to page 6, line 6. As a result, it is not necessary to trap excess phenolic compound and/or formaldehyde by subsequently reacting with urea or an amine. *See* present specification, page 6, lines 6 to 7. Tetart does not disclose the resin included in the product of claim 1, or recognize the benefits stemming therefrom.

As Tetart fails to disclose or suggest a product including fibers coated with a sizing composition including a resin obtained by reacting a phenolic compound simultaneously with formaldehyde and an aminoalcohol, Tetart fails to disclose or suggest each and every feature of claim 1.

Espiard and Zeng fail to remedy the deficiencies of Tetart. Espiard and Zeng are cited for their alleged disclosure of particular product configurations. *See* Office Action, page 3. However, Espiard and Zeng, like Tetart, fail to disclose or suggest a product including fibers coated with a sizing composition including a resin obtained by reacting a phenolic compound simultaneously with formaldehyde and an aminoalcohol.

As none of Tetart, Espiard and Zeng discloses or suggests a product including fibers coated with a sizing composition including a resin obtained by reacting a phenolic compound simultaneously with formaldehyde and an aminoalcohol, the combination of references fails to disclose or suggest each and every feature of claim 1.

The Office Action inquires as to the product configurations implied by Tetart. Applicants submit that the need for such information is moot in view of the arguments set

forth above. However, if further information from Applicant is deemed necessary, Applicants will comply with any formal requirement for information.

As explained, claim 1 would not have been rendered obvious by Tenart, Espiard and Zeng. Claims 2-9, 18, 19 and 22-24 depend from claim 1 and, thus, also would not have been rendered obvious by Tenart, Espiard and Zeng. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

For the foregoing reasons, Applicants submit that claims 1-9, 15, 17-19 and 22-24 are in condition for allowance. Prompt reconsideration and allowance are respectfully requested.

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